

Wind Energy Siting and Transmission

Challenges, Opportunities, & Solutions



“Multi-”Challenging

- Multiple Spatial Scales
 - Global, national, regional, state, local
 - Operate concurrently
 - Depends on discipline & agency

Lower foreign
dependence on oil



“OR”



Save the prairie-chicken

“Multi-”Challenging

- Multiple Disciplines
 - Different goals and outcomes
 - Biological
 - Social
 - Political
 - Economic
 - Determined by
 - Mission
 - Scale of operation

“Multi-”Challenging

- Multiple Agencies/Organizations
 - Operate at different scales
 - Managed according to different missions
 - Government (city, county, state, federal)
 - NGO (state, regional, national)
 - Industry (regional, national, global)
 - Stakeholders (local)

“Multi-”Challenging

- Multiple Impacts
 - Can be positive, negative, or both
 - Depends on scale, discipline, mission
 - May be cumulative and involve numerous different disturbances
 - Some may not be immediate or recognizable

Potential For Conflict Is High

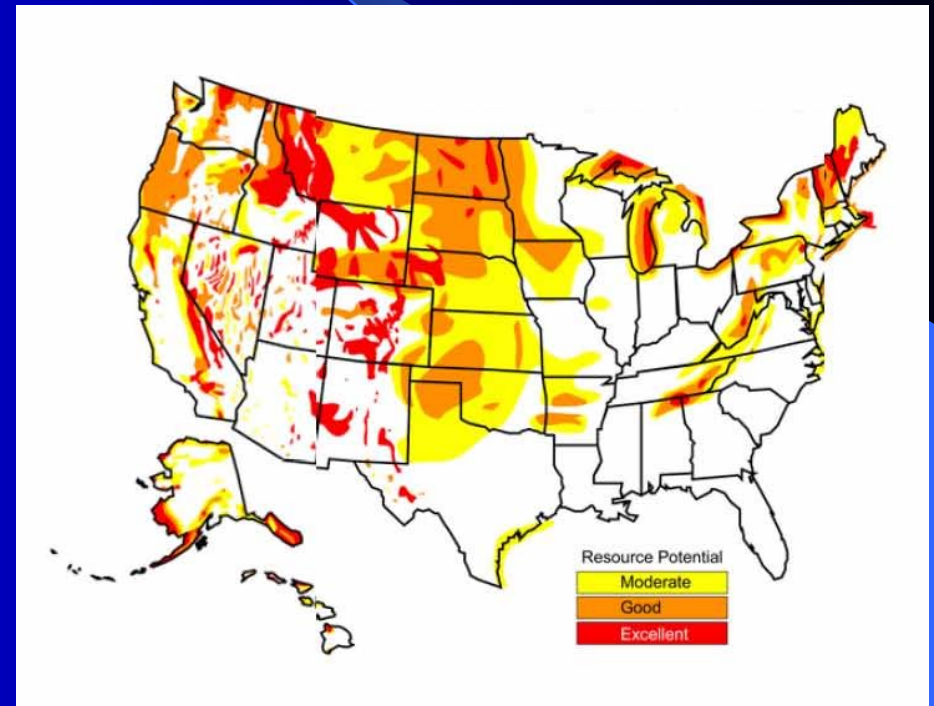
- Within & among multiple groups, including
 - Conservation agencies (wildlife, environment)
 - Energy industry (coal, gas, nuclear, wind, solar)
 - Public utilities (local transmission, energy zones)
 - Government (county, state, federal)
 - Local stakeholders (individuals, coalitions)

Reasons For Conflict

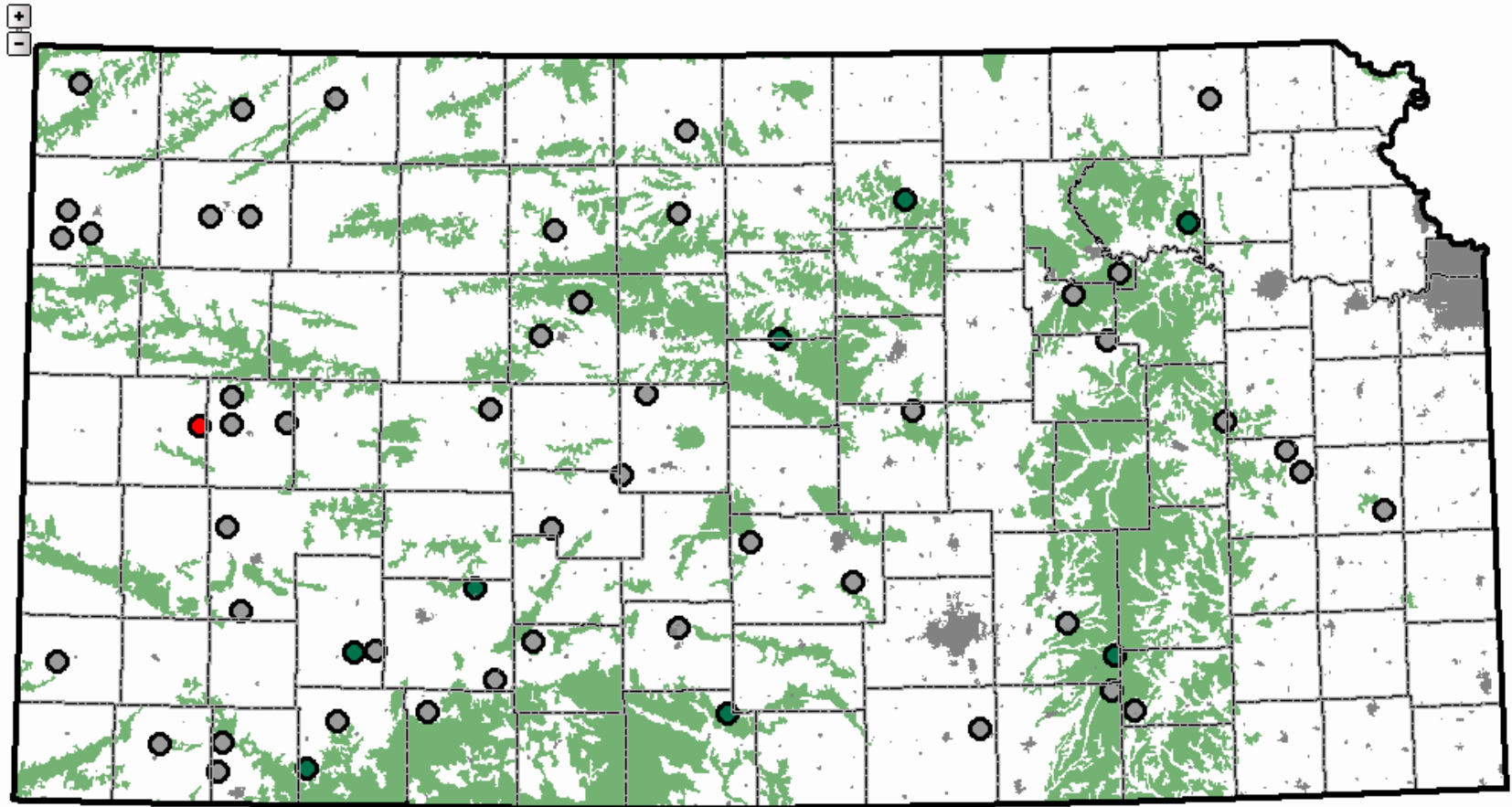
- Different missions
- Different scales of consideration
- Regulations vary
- Legislation/programs promote both development & conservation activities
- Lack of information
- Energy industry is dynamic & competitive

Wind Energy in Kansas (an example)

- Multiple spatial scales
 - Kansas ranks 3rd in potential wind energy
 - Top 8 states are members of the WGA
 - 12 of top 20 states are members of the WGA



Current Locations



20 10 0 20 Miles



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Internet

Wind Energy in Kansas

- Multiple Agencies/Organizations
 - National
 - USFWS, BLM, NPS, NRCS, USFS, AFWA, TNC, NWF, Audobon, AWEA, NWCC, AWWI
 - Regional
 - WGA, SWPP, WAFWA, PLJV, Westar, ITC
 - State
 - KDWP, AOK, KGLC, KAWS, SCC, KCC
 - Local
 - CCD, RC&D, Comanche Pool

Wind Energy in Kansas

- Multiple Biological Concerns

- Regional

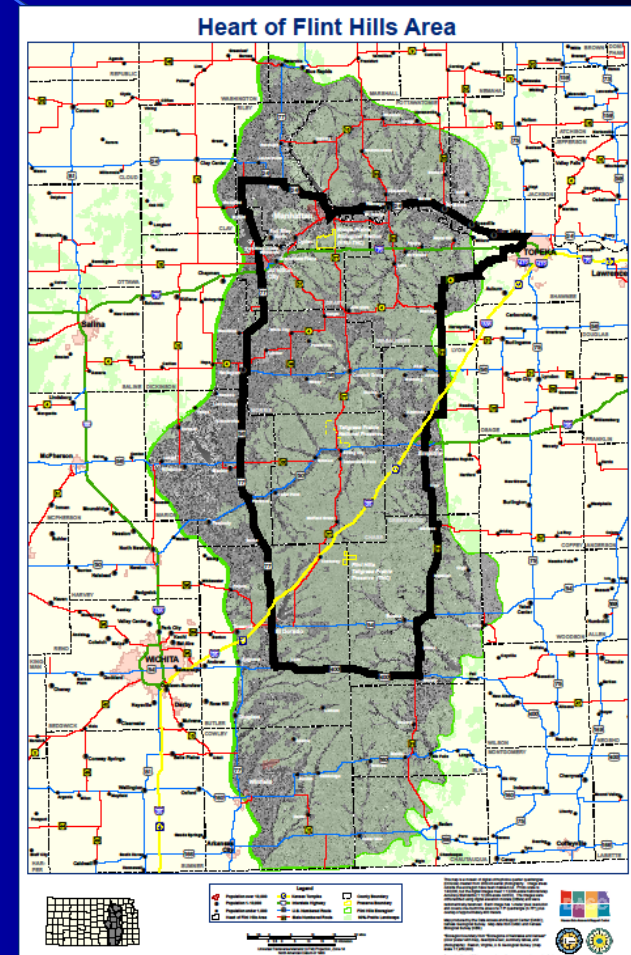
- Biological diversity
 - Federal T&E
 - Regional migratory corridors

- Kansas

- Prairie-chicken, whooping crane, bats
 - Other T&E, SINC
 - Intact grasslands & playa lakes
 - Streams & rivers (indirect)

Voluntary Guidelines Only

- Avoid
 - Unfragmented landscapes
 - High quality remnant prairie
 - T&E, SINC habitats
 - Sensitive areas
- Consider
 - Incorporating buffers
 - Consolidating infrastructure
 - Burying powerlines when feasible
 - Mitigation if impacts unavoidable



Wind Energy in Kansas

- Social/political/economic concerns
 - Regional
 - Tourism & scenic landscapes
 - Efficient energy delivery
 - Kansas
 - Hunting opportunity & license revenue
 - County economic development & tax base
 - Individual
 - Income
 - Private property rights
 - Viewshed

Wind Energy in Kansas

- Multiple Impacts
 - Proposed sites increasing
 - 100 MW in 2006
 - 450 MW in 2008
 - Proposed locations
 - Grasslands/Wetlands
 - Bat hibernacula
 - Site infrastructure
 - Roads & pads
 - Transmission
 - Number & location



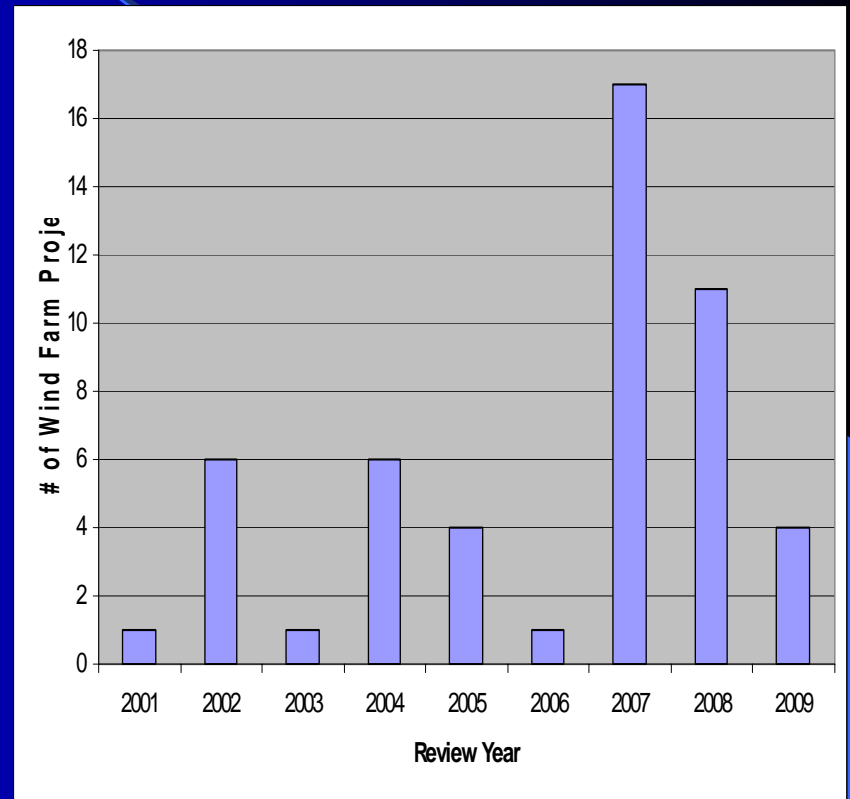
Potential Wildlife Impacts

- Direct wildlife mortality
 - Bats & birds
 - T&E species (e.g., cranes)
- Indirect wildlife impacts
 - Habitat loss/fragmentation
 - Habitat degradation
 - Erosion/sedimentation
 - Invasive species
 - Species avoidance
- Cumulative impacts



Wind Energy in Kansas

- Conflict increasing as infrastructure developed
 - All vs individual species
 - Environment vs wildlife
 - Local economy vs private landowner aesthetics
 - Production cost vs wildlife



Emerging Issues

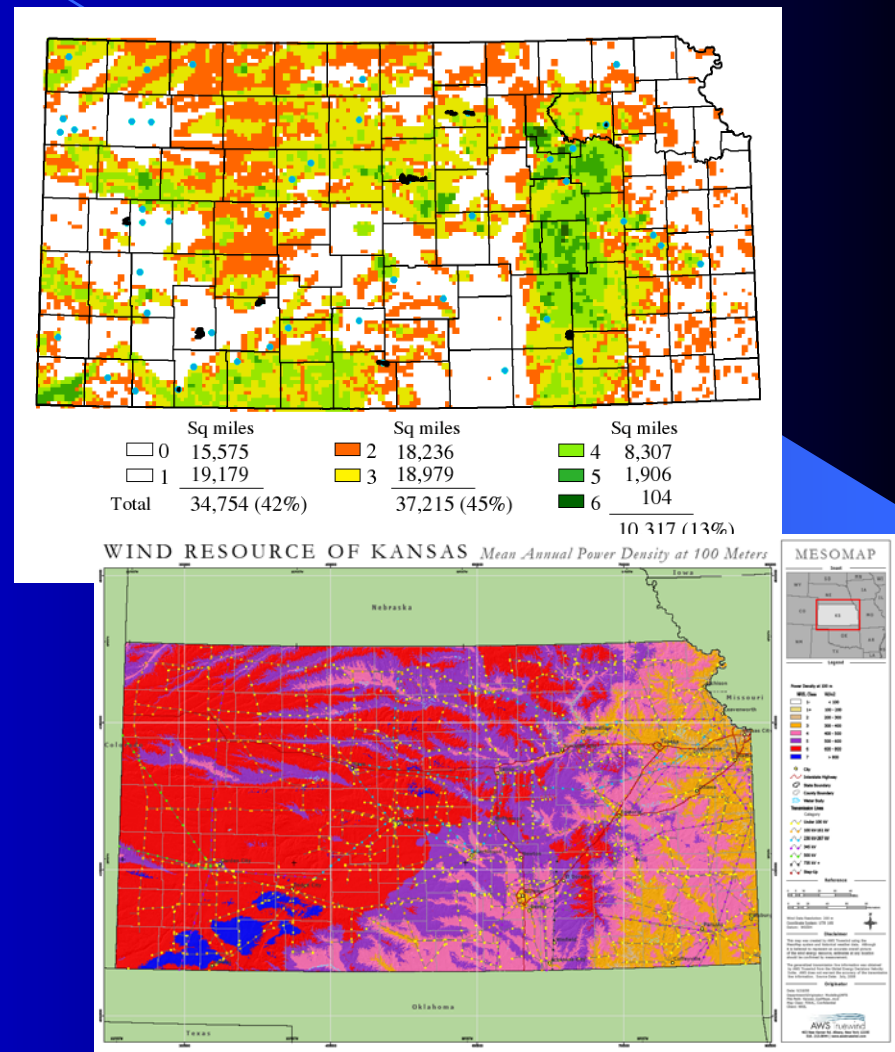
- General guidelines not sufficient as development accelerates
 - Industry requesting timely reviews & assurances
 - Biological reviews becoming more complex
- Increasing miscommunication
 - Among conservation organizations
 - Identification of important areas & species
 - How to address siting (e.g., green certification)
 - Between conservation groups & wind industry
 - Documentation of impacts (types, methods)
 - Compensation vs mitigation

Solutions

- Clear interpretation of mission
 - Define terms and increase specificity
 - Sensitive areas & species
 - Fragmentation
 - Significant impacts
 - Integrate mission of various agencies
- Strategic long-term planning
 - Consider multiple threats simultaneously
 - Cross state lines and pursue regional plans
 - Goals/objectives based on credible and defensible techniques
 - Decisions process-based, repeatable, and can be updated as new information becomes available
 - Dynamic but not disorganized

Solutions

- Improve communication
 - Written documents
 - Concise, unambiguous
 - Use technology to encompass multiple special scales, merge disciplines, & provide dynamic updates
 - Web mapping tools
 - On-line geospatial databases



Consequences of Not Undertaking Refinements

- Increased potential for conflict
 - Lost profits by industry
 - Criticism regarding fair and equitable treatment
- Risk decisions being made by others that are not aware of state-specific issues & concerns
 - Western Governors Association REZ
 - Playa Lakes Joint Venture
- Loss of critical wildlife habitat that could lead to future issues (e.g., listing)